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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,374	02/15/2002	Mihaela Van Der Schaar	US 020044	1300
24737	7590	04/28/2009		
PHILIPS INTELLECTUAL PROPERTY & STANDARDS			EXAMINER	
P.O. BOX 3001			CZEKAJ, DAVID J	
BRIARCLIFF MANOR, NY 10510			ART UNIT	PAPER NUMBER
			2621	
MAIL DATE		DELIVERY MODE		
04/28/2009		PAPER		

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* MIHAELA VAN DER SCHAAR

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Appeal 2009-0572  
Application 10/076,374<sup>1</sup>  
Technology Center 2600

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Decided:<sup>2</sup> April 28, 2009

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Before ROBERT E. NAPPI, MARC S. HOFF, and ELENI MANTIS-MERCADER, *Administrative Patent Judges*.

HOFF, *Administrative Patent Judge*.

DECISION ON APPEAL

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<sup>1</sup> The real party in interest is Koninklijke Philips Electronics N.V.

<sup>2</sup> The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

### STATEMENT OF CASE

Appellant appeals under 35 U.S.C. § 134 from a Final Rejection of claims 21-40.<sup>3</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellant's invention relates to a method and apparatus for fine granular scalability (FGS) video encoding. For each individual transform block in an image frame, a plurality of residual coefficients are decomposed, and a plurality of bit-planes or discrete quantization steps are processed for the block, before decomposing coefficients for the next transform block in the image frame (Spec. 4).

Claims 21 and 38 are exemplary:

21. A method comprising:
  - receiving a plurality of transform blocks in a sequential transform-block order,
    - converting each of the plurality of transform blocks into a plurality of bit-plane encodings,
    - storing each of the plurality of bit-plane encodings in a sequential bit-plane order of a memory prior to converting another of the plurality of transform blocks, and
    - transmitting each bit-plane encoding of the plurality of transform blocks in the sequential bit-plane order.
  
38. A computer readable medium that includes computer program code, which, when executed on a processor, enables the processor to:
  - receive a plurality of transform blocks in a sequential transform-block order,
  - convert each of the plurality of transform blocks into a plurality of bit-plane encodings, and

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<sup>3</sup> Claims 1-20 have been canceled.

store each of the plurality of bit-plane encodings in a sequential bit-plane order of a memory prior to converting another of the plurality of transform blocks.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Lafe	US 6,456,744 B1	Sep. 24, 2002
Chen	US 6,798,364 B2	Sep. 28, 2004
Wu	US 6,956,972 B2	Oct. 18, 2005
Monro	WO 98/37700	Aug. 27, 1998

Claims 38-40 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Claims 21-27, 29-32, 35, 36, 38, and 40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wu in view of Chen.

Claims 28 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wu in view of Chen and Lafe.

Claims 33, 34, and 39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wu in view of Chen and Monro.

Throughout this decision, we make reference to the Appeal Brief (“Br.” filed January 11, 2007) and the Examiner’s Answer (“Ans.” mailed May 18, 2007) for their respective details.

## ISSUES

Appellant argues that claims 38-40 recite patent-eligible subject matter under 35 U.S.C. § 101, and that the Examiner erred in rejecting claims 21-40 under 35 U.S.C. § 103 because the combination of Wu and Chen fails to teach storing each of the plurality of bit-plane encodings in a

sequential bit-plane order of a memory prior to converting another of the plurality of transform blocks (Br. 6, 7).

Appellant's arguments present us with the following two issues:

1. Has Appellant shown that the Examiner erred in finding that claims 38-40 recite subject matter that is not eligible for patent protection?

2. Has Appellant shown that the Examiner erred in finding that Wu in combination with Chen teaches storing each of the plurality of bit-plane encodings in a sequential bit-plane order of a memory prior to converting another of the plurality of transform blocks, as independent claims 21, 29, and 38 require?

#### FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

##### *The Invention*

1. According to Appellant, the invention concerns a method and apparatus for fine granular scalability (FGS) video encoding. For each individual transform block in an image frame, a plurality of residual coefficients are decomposed, and a plurality of bit-planes or discrete quantization steps are processed for the block, before decomposing coefficients for the next transform block in the image frame (Spec. 4).

2. Appellant discloses that his invention may be embodied in the form of computer program code “embodied in tangible media, such as floppy diskettes, read only memories (ROMs), CD-ROMs, hard drives, high density (e.g., ‘ZIP<sup>TM</sup>’) removable disk drives, or any other computer readable storage medium” (para. 0061).

3. Appellant's invention "may also be embodied in the form of computer program code, for example, whether stored in a storage medium, loaded into and/or executed by a computer, or transmitted over some transmission medium, such as over the electrical wiring or cabling, through fiber optics, or via electromagnetic radiation" (para. 0061).

*Wu*

4. Wu teaches a video encoding scheme employing progressive fine-granularity scalable (PFGS) layered coding to encode video data frames into multiple layers, including a base layer of comparatively low quality video and multiple enhancement layers of increasingly higher quality video (col. 3, ll. 29-33).

5. Wu teaches dividing a frame into 8x8 blocks (col. 8, l. 57). Discrete Cosine Transformation is then performed at module 208, followed by quantification at module 210 (col. 9, ll. 3-5).

6. Anti-quantification occurs at module 214, and inverse DCT transformation at module 216; a residue block, still 8x8, is formed by find reference module 220 (col. 9, ll. 13-26, 36-40).

7. Bit-plane variable length encoding of each residue block occurs at module 226(1)-226(n) (col. 9, ll. 46-50).

*Chen*

8. Chen teaches a method and apparatus for variable length coding. The method comprises receiving a group of data having a group of set values, identifying a group of positions of the group of set values within the group of data without branching, and for each of the group of positions, encoding a run of non-set values preceding each of the group of positions (Abstract).

9. Chen teaches storing an extracted bit-plane in multiple passes. At the end of each pass, the selected bits of the current pass are extracted into the right-most position of a buffer (col. 5, ll. 22-37).

*Lafe*

10. Lafe teaches a method and apparatus for video data compression which operates dynamical systems, such as cellular automata (col. 1, ll. 11-14).

*Monro*

11. Monro teaches a method and apparatus for image compression, particularly a progressive block-based embedded DCT coder (p. 1).

PRINCIPLES OF LAW

A transitory, propagating signal is not a “process, machine, manufacture, or composition of matter.” Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter. *In re Nuijten*, 500 F.3d 1346, 1357 (Fed. Cir. 2007) *reh’g en banc denied*, 515 F.3d 1361 (Fed. Cir. 2008), *cert. denied*, 129 S.Ct. 70 (2008).

“If a claim covers material not found in any of the four statutory categories, that claim falls outside the plainly expressed scope of § 101 even if the subject matter is otherwise new and useful.” *Id.* at 1354.

Even when a claim covers patentable subject matter within the scope of 35 U.S.C. § 101, if the claim also covers subject matter that would be unpatentable under § 101, then applicant must limit the claim to avoid the nonstatutory subject matter to in turn avoid a rejection under § 101.

*Cf. Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1329

(Fed. Cir. 2003) (“By limiting its claims in this way Amgen simply avoids claiming specific subject matter that would be unpatentable under § 101.”); *see also* MPEP § 2105 (“If the broadest reasonable interpretation of the claimed invention as a whole encompasses a human being, then a rejection under 35 U.S.C. 101 must be made indicating that the claimed invention is directed to nonstatutory subject matter.”).

Section 103 forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”

*KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.”)

In *KSR*, the Supreme Court emphasized “the need for caution in granting a patent based on the combination of elements found in the prior art,” *id.* at 1739, and discussed circumstances in which a patent might be determined to be obvious. In particular, the Supreme Court emphasized that “the principles laid down in *Graham* reaffirmed the ‘functional approach’ of *Hotchkiss*, 11 How. 248.” *KSR*, 127 S. Ct. at 1739 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 12 (1966) (emphasis added)), and reaffirmed

principles based on its precedent that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* The Court explained:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

*Id.* at 1740. The operative question in this “functional approach” is thus “whether the improvement is more than the predictable use of prior art elements according to their established functions.” *Id.*

## ANALYSIS

### SECTION 101 REJECTION

We select claim 38 as representative of this group, pursuant to our authority under 37 C.F.R. § 41.37(c)(1)(vii).

Claim 38 recites “[a] computer readable medium that includes computer program code, which, when executed on a processor, enables the processor to … [perform claimed method steps].” Appellant discloses that his invention may be embodied in the form of computer program code “embodied in tangible media, such as floppy diskettes, read only memories (ROMs), CD-ROMs, hard drives, high density (e.g., “ZIP™”) removable disk drives, or any other computer readable storage medium” (FF 2). In the alternative, Appellant’s invention “may also be embodied in the form of computer program code, for example, whether stored in a storage medium,

loaded into and/or executed by a computer, or transmitted over some transmission medium, such as over the electrical wiring or cabling, through fiber optics, or via electromagnetic radiation” (FF 3).

Computer program code that is transmitted over wiring or cabling, or via electromagnetic radiation, amounts to a transitory, propagating signal, which is not patentable subject matter. *Nuijten*, 500 F.3d at 1357. The scope of Appellant’s disclosure means that claim 38 covers subject matter patentable under § 101 as well as subject matter unpatentable under § 101. As a result, Appellant must limit claim 38 to avoid nonstatutory subject matter, in order to avoid a rejection under § 101. Cf. *Amgen*, 314 F.3d at 1329.

Because Appellant’s claim 38 is not so limited, we will sustain the Examiner’s rejection of claims 38-40 under 35 U.S.C. § 101 as being directed to nonstatutory subject matter.

#### CLAIMS 21-27

We select claim 21 as representative of this group, pursuant to our authority under 37 C.F.R. § 41.37(c)(1)(vii).

Appellant argues that the combination of Wu and Chen does not teach “storing each of the plurality of bit-plane encodings in a sequential bit-plane order of a memory prior to converting another of the plurality of transform blocks,” as recited in claim 21 (Br. 6). According to Appellant, Wu teaches that “all of the blocks are transformed before the bit-plane encoding occurs,” contrary to the requirement of claim 21 (*id.*). Because Wu includes a Frame Memory 222, Appellant alleges, “Wu’s bit level encoding is applied after an entire frame of a plurality of DCT blocks is processed” (*id.*). Appellant argues that Chen fails to remedy the deficiencies of Wu, because although

Chen teaches variable length encoding, Chen does not address the source of the data that is being encoded, and “does not address the order in which [sic] the source data is created with respect to the processing of the transform blocks” (*id.*).

Appellant’s arguments are not persuasive of Examiner error. With particular reference to Figure 9, Wu teaches dividing a frame into 8x8 blocks (FF 5). Discrete Cosine Transformation is then performed at module 208, followed by quantification at module 210 (FF 5). Anti-quantification occurs at module 214, and inverse DCT transformation at module 216; a residue block, still 8x8, is formed by find reference module 220 (FF 6). Finally, bit-plane variable length encoding of each residue block occurs at module 226(1)-226(n) (FF 7).

The Examiner concedes that Wu does not clearly show storing in a sequential bit-plane order of memory (Ans. 7), and relies on Chen to teach storing an extracted bit-plane in multiple passes. At the end of each pass, the selected bits of the current pass are extracted into the right-most position of a buffer (FF 9).

We concur in the Examiner’s conclusion that it would have been obvious to combine Wu with Chen to achieve the claimed coder that stores a plurality of bit-plane encodings in a sequential bit-plane order of a memory prior to converting another block, to achieve the advantage of preventing processor slowdown (Ans. 4). The mere inclusion of a “frame memory” in Wu does not establish that Wu transforms all blocks before bit-plane encoding occurs, and Appellant’s allegation to the contrary is not supported by evidence. Appellant’s argument that Chen does not disclose the source of the data to be variable length encoded is similarly unpersuasive, as the

Examiner does not rely on Chen to teach the type of data to be encoded, finding that Wu teaches motion compensation based video coding (Ans. 3).

Therefore, because Appellant has not established error in the Examiner's rejection, we will sustain the Examiner's rejection of claim 21-27 under 35 U.S.C. § 103.

#### CLAIM 24

Appellant argues separately for the patentability of claim 24. The substance of Appellant's arguments, however, amounts to the same individual attacks on the Chen reference that were leveled against Chen with respect to claim 21, *i.e.* that Chen does not address the source of the data to be variable-length encoded, and that Chen does not teach storing a bit-plane encoding for each block at memory locations following the stored encodings of a prior transform block (Br. 7).

As noted *supra*, however, we find such arguments unpersuasive. The Examiner did not rely upon Chen to teach the source of the data to be encoded. Further, we concur in the Examiner's finding that Chen teaches storing bit-plane encodings in a sequential bit-plane order of a memory. Because Chen teaches storing each successive encoding pass adjacent to the results of the previous pass (FF 9), Chen therefore also teaches storing the bit-plane encoding for each subsequently received transform block in memory locations following those of the prior received transform block, as claim 24 requires.

Because Appellant has not established error in the Examiner's rejection, we will sustain the Examiner's rejection of claim 24 under 35 U.S.C. § 103.

SECTION 103 REJECTION OF CLAIMS 29-32, 35, 36, 38, AND 40

Independent claims 29 and 38 contain limitations identical to those argued with respect to claim 21, to wit, “stor[ing] each of the plurality of bit-plane encodings in a sequential bit-plane order of the memory prior to converting another of the plurality of transform blocks.” With respect to these claims, Appellant relies on the arguments made in favor of the patentability of independent claim 21.

Because we sustain the rejection of claim 21, then, we will also sustain the rejection of claims 29-32, 35, 36, 38, and 40 under 35 U.S.C. § 103, for the same reasons.

CLAIMS 28 AND 37

We affirm *supra* the rejection of parent claims 21 and 29 under 35 U.S.C. § 103 as unpatentable over Wu in view of Chen. Appellant presents no separate argument for the patentability of dependent claims 28 and 37. We will therefore sustain the rejection of claims 28 and 37 under 35 U.S.C. § 103 as unpatentable over Wu in view of Chen and Lafe, for the same reasons expressed with respect to claim 21.

§ 103 REJECTION OF CLAIMS 33, 34, AND 39

We affirm *supra* the rejection of parent claims 29 and 38 under 35 U.S.C. § 103 as unpatentable over Wu in view of Chen. Appellant presents no separate argument for the patentability of dependent claims 33, 34, and 39. We will therefore sustain the rejection of claims 33, 34, and 39 under 35 U.S.C. § 103 as unpatentable over Wu in view of Chen and Monro, for the same reasons expressed with respect to claim 21.

**CONCLUSIONS OF LAW**

1. Appellant has not shown that the Examiner erred in finding that claims 38-40 recite subject matter that is not eligible for patent protection.

2. Appellant has not shown that the Examiner erred in finding that Wu in combination with Chen teaches storing each of the plurality of bit-plane encodings in a sequential bit-plane order of a memory prior to converting another of the plurality of transform blocks, as independent claims 21, 29, and 38 require.

**ORDER**

The Examiner's rejection of claims 21-40 is affirmed.

Appeal 2009-0572  
Application 10/076,374

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

ELD

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